Shoes & Socks



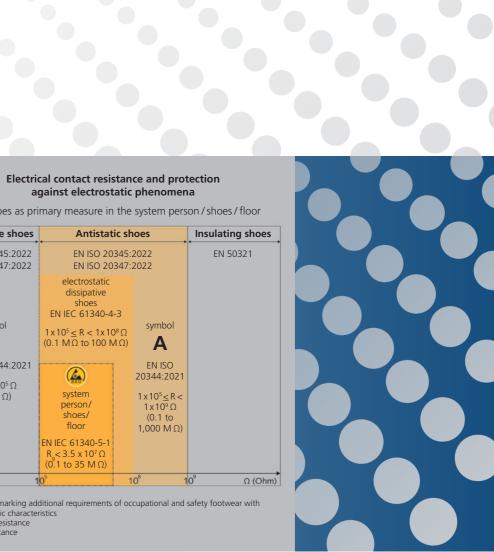


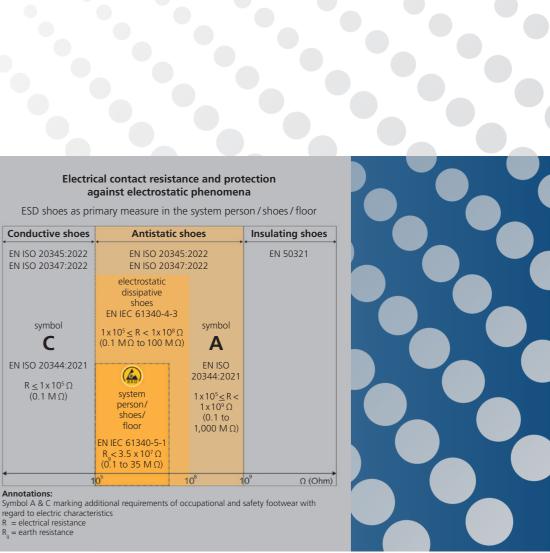
resting facts about cleanroom shoes	70 – 71
lanation of symbols	72
gs	73
pers and sandals	74
ety shoes: slippers, clogs and sandals	75
and TPE clogs	76
hangeable insoles	77
anroom socks	78
duct recommendations erring to cleanroom classes	79

You will find overshoes and overboots in Part 1, pages 44 – 46: Reusable Part 2, pages 30 – 31: Disposable



Interesting facts about cleanroom shoes





be happy to advise you on yo th samples testing

We will

Cleanroom compatible shoes should protect products and processes like all other garments which are worn by humans in a cleanroom.

In comparison to ordinary occupational shoes, cleanroom compatible shoes differentiate themselves in a number of ways:

As far as the materials used are concerned, it is important to ensure that cleanroomcompatible shoes do not become a significant source of particles. Therefore, one of the key words is "abrasion resistance". This means in particular the use of synthetic materials, the use of closed shoes, etc.

Also a very important aspect is the shoe change in the air lock area to avoid cross contamination as much as possible. Cleanroom shoes are only allowed to be worn in cleanrooms or in adjacent lock areas.

Sufficient conductivity of the shoe up to ESD properties are also further prerequisites.

As for these product line personal protection has found its way in cleanroom areas, the safety of the user plays in a lot of cases also a vital role. Hence, when making a decision, the relevant norms and guidelines have to be taken into account, such as tread-proofness, slip resistance, toe protection etc.

The from user's point of view important product characteristics, such as fit, wear comfort etc., also have to be conciliated with your cleanroom specific requirements.

The following pages of this chapter should help you to choose the right shoe models for your process specific requirements.

Technical information

ESD Electrostatic Discharge

Wearing so-called ESD shoes is intended to prevent disruptive discharges between the wearer and his environment. According to standard EN 61340-5-1:2016, the contact resistance should be less than 3.5×10^7 ohms.

Steel toe cap, aluminium toe cap and composite toe cap

All three variants are certified according to EN ISO 22568-1, -2, -3, -4:2019 for outside and EN ISO 20344 for inside the shoe. The composite toe cap is extremely impact resistant, highly elastic and approx. 50% lighter than the steel toe cap. The aluminium toe cap is also approx. 50% lighter than the steel toe cap.

Identification: SB [OB], S1 [01], S2 [02] and S3 [03]

These markings reflect the requirements for safety shoes and (voluntary) additional requirements according to EN ISO 20345 [occupational shoes according to EN ISO 20347].

Basic ree	quirement:	Slip resis The ener
Additio	nal requirements:	S1 – as sene
		S2 – san wa
		S3 – like

4.1

stance SB, divided into 3 classes (SRA, SRB or SRC). ergy absorption of the toe cap is 200 joules.

SB, additional antistatic, oil and petrol resistant outsole, ergy absorption in the heel area

me as S1, additional resistance of the shoe upper against ater penetration and water absorption

S2, additional penetration resistance and profiled outsole

Explanation of symbols

Marking according to EN ISO 20347

Marking according to EN ISO 20347

Marking according to EN ISO 20347

Closed heel area + antistatic + energy absorption

Like O1 + water passage and water absorption

Like O2 + puncture resistance and profiled outsole

Clogs

4.2

Standard / ESD / antistatic version



OB

S1

S2

S3

SB

SRA

SRB

ACCE

Antistatic shoes

capacity in the heel area

Energy absorption capacity in the heel area

Fuel resistance

Basic requirement occupational footwear according to EN ISO 20347 Slip resistance (SRA, SRB or SRC)

Marking according to EN ISO 20345 Closed heel area + antistatic + energy absorption capacity in the heel area



Marking according to EN ISO 20345 Like S1 + water passage and water absorption

Marking according to EN ISO 20345 Like S2 + penetration resistance and profiled outsole

Basic requirement safety shoes according to EN ISO 20345 Slip resistance (SRA, SRB or SRC) + energy absorption of the toe cap (200 joules)

Anti-slip on floors with ceramic tiles with sodium lauryl sulphate solution (SLS)

Anti-slip on steel floor with glycerol



SRA + SRB







Composite toe cap

Adjustable, movable heel strap



Breathable textile

Resistance to penetration



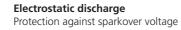
Multiple cushioning





Suitable for kitchen use







Autoclavable at 121 °C



Washable Degree as shown in each case



Suitable for dryers Degree as shown in each case



NO

Does not contain a nanomaterial as defined in Recommandation 2011/696/EU

PPE foot protection according to DGUV regulation

Nanomaterial: a natural, incidental or manufactured material containing particles, in an unbound state or as an aggregate or as an agglomerate and where, for 50% or more of the particles in the number size distribution, one or more external dimensions is in the size range 1 nm – 100 nm.





Possible on request: Special models up to size 50 as well as orthopaedic shoes!

Necessary basic requirements for cleanroom compatible occupational shoes, depending on the respective application:

- abrasion-resistant and closed outsole materials
- anti-slip soles
- ▶ antistatic or ESD-compliant, if required
- washability (applies only to microfibre)
- controlled areas

white black navy blue white/light

	Size	Colour	Upper material	Art. No.		
	35-48		smooth leather, not perforated	32010-8		
	30-48		smooth leather, perforated	32030-8		
	35–48	•	smooth leather, not perforated	32020-8		
	35–47		microfibre, not perforated	327785-8		
	35-47		microfibre, perforated	327786-8		
	36-42		microfibre, not perforated	327781		
	50-42		microfibre, perforated	327782		
	36–47		smooth leather, not perforated	32110		
	50-47		smooth leather, perforated	32100		
	35–48	•	smooth leather, not perforated	327787		
	35–48		smooth leather, not perforated	32121		
	36-47	•	microfibre, perforated	327784		
blue	ue 🕕 white/blue 🌗 white/red 🌑 black/ brown					

- ▶ abrasion-resistant upper materials
- disinfectability, especially for the use in microbiological

The following norms, among others, are relevant: CE, EN ISO 20347, ESD according to EN 61340 etc.



dirlex **₹73**

Slippers and sandals

Standard/ESD/antistatic version

Safety shoes: slippers, clogs and sandals

		Å		7151	SBA
Slippers / Occupational shoes	Size	Colour	Upper material	Art. No.	1
AIR CUSHION, breathable, moisture absorbing lining 01 SRA (A) (A) (A)	35–47	\bullet	smooth leather, perforated	32420	
X-LIGHT, elastic instep area* 02 SRC FO A 🐼 😒 🕺 📾	35–48	$\circ ullet$	smooth leather, not perforated	32470	
UNI6, elastic instep area, foamed PU midsole 02 SRC FO A A S S S & S S	35–48	••	microfibre, perforated	32479	III.
AIR CUSHION, elastic instep area, integrated footbed 01 SRA (A) (A) (A) (B) (B) (B) (B) (B) (B) (B) (B) (B) (B	35–47	•	microfibre, laterally perforated	32310	
ZWIESEL , elastic instep area, DRYtech textile, antibacterial 02 SRA (A) (A) (C)	36–47	•	microfibre, not perforated	31262	
white black					

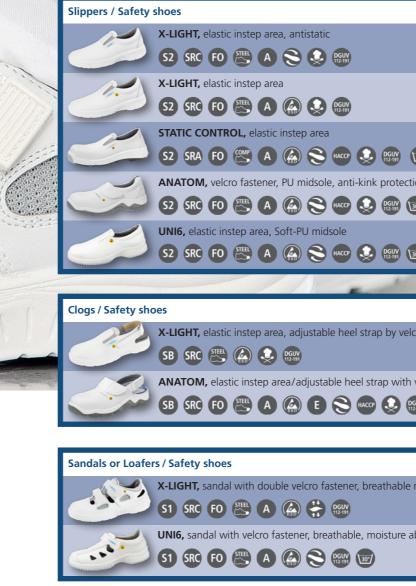
* also available with zip (plastic) for textile shaft to improve air impermeability between shoe and trouser leg, Art. No. 32470T1RV1 (see part 1, page 46)

Sandals / Occupational shoes	Size	Colour	Upper material	Art. No.
UNI6, with adjustable instep area, velcro fastening 01 SRC A 🐼 😒 🐯 😈	35–48	•	microfibre, perforated	32481

Necessary basic requirements for cleanroom compatible occupational shoes, depending on the respective application:

- ▶ abrasion-resistant upper materials
- abrasion-resistant and closed outsole materials
- anti-slip soles
- ▶ antistatic or ESD-compliant, if required
- washability (applies only to microfibre)
- disinfectability, especially for the use in microbiological controlled areas

The following norms, among others, are relevant: CE, EN ISO 20347:2012, ESD according to EN 61340-4-3, -5-1 etc.



Necessary basic requirements for cleanroom compatible safety shoes, depending on the respective application:

- abrasion-resistant upper materials
- abrasion-resistant and closed outsole materials
- anti-slip outsoles
- ▶ toe caps made of steel, aluminium or composite (plastic)
- ▶ antistatic or ESD-compliant, if required
- washability (applies only to microfibre)
- b disinfectability, especially for the use in microbiological controlled areas

The following norms, among others, are relevant: CE, EN ISO 20345, ESD according to EN 61340 etc.

Standard / ESD / antistatic version

	Size	Colour	Upper material	Art. No.
	35–48	••	smooth leather not perforated	32531
	35–48	$\circ ullet$	smooth leather not perforated	32530
300 METAL	36–47	•	microfibre, not perforated	32564
ction, torsion joint	36-52	$\bigcirc ullet$	microfibre, not perforated	32548
39	35–48	•	microfibre, not perforated	32246

				and an and a state of the
	Size	Colour	Upper material	Art. No.
elcro fastening	35–48	••	smooth leather not perforated	32515
th velcro fastener	36-52	•	microfibre, not perforated	32539

	Size	Colour	Upper material	Art. No.
e mesh-inserts	35–48	••	smooth leather, textile inserts	32542
absorbing lining	35–48	•	microfibre, air inserts	32480

Possible on request: Special models up to size 52 as well as orthopaedic shoes!



PU and TPE clogs

Standard/antistatic version

Exchangeable insoles



*double size: please always specify the straight size when ordering: 36, 38, 40, 42, 44, 46

Necessary basic requirements for cleanroom compatible occupational shoes, depending on the respective application:

- ▶ abrasion-resistant upper materials
- abrasion-resistant and closed outsole materials
- anti-slip soles
- ▶ antistatic or ESD-compliant, if required
- washability
- disinfectability and and sterilisability, especially for the use in microbiological controlled areas

The following norms, among others, are relevant: CE, EN ISO 20347, ESD according to EN 61340 etc.



Exchangeable insoles for	Properties	Size	Colour	Version		Art. No.
X-LIGHT, occupational shoes with Active Comfort insole	OB A	35 – 48		open closed		32980 32980-1
X-LIGHT, safety shoes with Active Comfort insole	52 A 🏟	35 – 48	•	closed		32981
DYNAMIC, occupational shoes with Active Comfort insole	OB A	35 – 48		open		32984
EASY, occupational shoes with Active Comfort insole	OB A 🏟	35 – 48	•	open		32987
ANATOM, safety shoes with Active Comfort insole	52 A	36 – 52		open closed		32985-1 32985
CRAWLER, safety shoes with Active Comfort insole	52 A 🏟	36 – 48	•	open closed		32986 32986-1
UNI6, safety shoes with Soft Comfort insole	52 A ᢙ	35 – 48		closed	S M W	32983 32983-1 32983-2
UNI6, safety shoes with Active Comfort insole	S2 A 🏟	35 – 48		closed		32983-4

Innovative antibacterial lining materials and exchangeable Active Comfort/Soft Comfort insoles ensure optimal temperature and moisture balance in open or closed ABEBA® shoes. The lightweight insoles also optimise the cushioning properties, which relieve the feet even on long days. If necessary, suitable insoles can be offered for orthopaedic finishing.





4.7

SHOES & SOCKS

dartex **₹**77

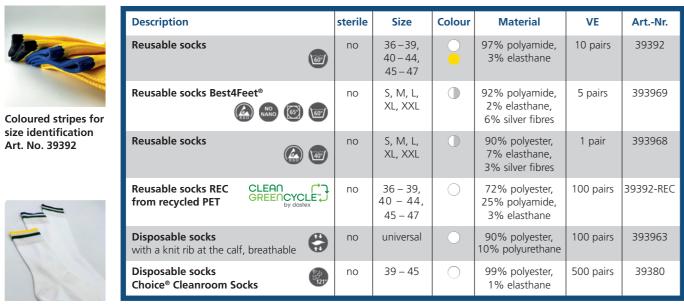
Cleanroom socks

Material selection

Increasingly, there are specifications, such as Annex 1 of the European GMP guidelines, for the use of cleanroom suitable socks, especially in aseptic areas. Both disposable socks and washable synthetic reusable models are used there.

Natural fibres are unsuitable due to their abrasion and the risk of fibre breaks. Synthetic materials, however, have clear advantages. As far as wearing comfort is concerned, the fit and thus the wearing sensation can be improved by using special synthetic fibres with high elasticity. Cleanroom socks with silver fibres or fibres with embedded silver ions also have antimicrobial properties and improve the electrostatic properties.





Coloured stripes for size identification Art. No. 39392-REC

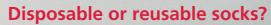
Be sure to select reusable socks one size larger. Due to their material properties, cleanroom socks shrink significantly more during the washing process.

Necessary basic requirements for cleanroom-suitable socks, depending on the respective application:

- abrasion-resistant material (synthetic)
- conductivity, ESD-compliant if required
- washability
- sterilisability, for use in microbiological monitored areas



Cuff with ESD logo Art. No. 393968



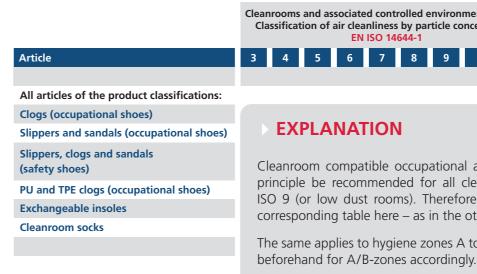
The logistical effort is significantly lower with the one-way solution. Furthermore, you avoid the problem of having to personalise washed socks in order to assign them to their wearers. The disadvantages, on the other hand, are a poorer fit, since disposable socks are usually only available in universal sizes, and in the long term a higher cost factor and increased waste.



Most important advantage of reusable socks: Properly decontaminated, they are usually much less contaminated with particles than disposable items when delivered.



Product recommendations referring to cleanroom classes





Cleanrooms and associated controlled environments - Part 1 Classification of air cleanliness by particle concentration EN ISO 14644-1 7 8 low dust 9

Hygiene zones (microbiological controlled areas) according to GMP

C D

dark⊕x **₹**79

B

Δ

Cleanroom compatible occupational and safety shoes and socks can in principle be recommended for all cleanroom classes from ISO 5 up to ISO 9 (or low dust rooms). Therefore, we have refrained from listing a corresponding table here – as in the other chapters.

The same applies to hygiene zones A to D, if the items have been sterilised